

## SensorTile.box firmware OTA function restore



### Features

- Restores FOTA functionality deleted by custom firmware.
- Requires the following:
  - [STEVAL-MKSBOX1V1](#) (SensorTile.box) board
  - Mini USB B to USB-B cable
  - Micro USB-B to USB-B cable
  - [ST-LINK/V2](#) programmer with correct driver installed on PC
  - STM32 ST-LINK Utility (STSW-LINK004) software installed on PC
  - Smartphone with [ST BLE Sensor](#) app installed
  - JTAG adapter board V1.0: adapter from JTAG20 to STDC14 connector
  - Flat cable to connect JTAG adapter to SensorTile.box
  - BLEFOTA\_BL.bin firmware file

### Description

The [STEVAL-MKSBOX1V1](#) (SensorTile.box) is a ready-to-use wireless IoT and wearable sensor box kit designed to help simplify app development based on remote motion and environmental sensor data.

The kit firmware provides a range of development modes: from Entry Mode for developers with little or no programming skills, to Pro Mode where users can load custom firmware on the SensorTile.box STM32 microcontroller.

The [STSW-MKSBOX1\\_BL](#) firmware allows you to restore the ability to upgrade firmware over the air (FOTA) in the event that FOTA functionality is overwritten or deleted due to a custom firmware upload.

Product summary	
Firmware OTA restore for SensorTile.box	<a href="#">STSW-MKSBOX1_BL</a>
Wireless multi sensor development kit for IoT and wearable sensor applications	<a href="#">STEVAL-MKSBOX1V1</a>
ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32	<a href="#">ST-LINK/V2</a>
STM32 ST-LINK utility	<a href="#">STSW-LINK004</a>
ST-LINK, ST-LINK/V2, ST-LINK/V2-1, STLINK-V3 boards firmware upgrade	<a href="#">STSW-LINK007</a>
ST-LINK/V2-1 USB driver on Windows Vista, 7 and 8	<a href="#">STSW-LINK008</a>
ST-LINK, ST-LINK/V2, ST-LINK/V2-1 USB driver signed for Windows7, Windows8, Windows10	<a href="#">STSW-LINK009</a>

Product summary	
Applications	IoT for Smart Things
	IoT for Smart Home and City
	Wearable

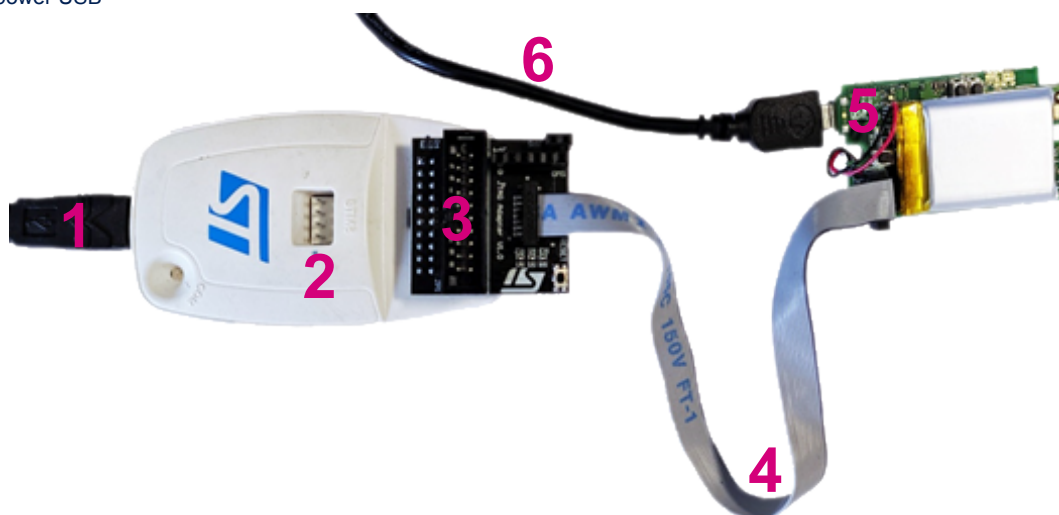
## 1 FOTA restore procedure

### 1.1 Connect the hardware

- Step 1.** Connect the JTAG adapter to the ST-LINK/V2 programmer and debugger.
- Step 2.** Connect the flat cable between the ST-LINK programmer/debugger and SensorTile.box. Pin 1 is labeled on both parts and should be connected with the cable pin 1 (black wire).
- Step 3.** Supply USB power (PC or wall charger) to the SensorTile.cox board via a microUSB-B cable.
- Step 4.** Connect the ST-LINK/V2 to the PC via USB cable.

**Figure 1. Connecting the SensorTile.box, JTAG adapter and ST-LINK programmer**

- 1. PC-USB
- 2. ST-LINK/V2
- 3. JTAG adapter
- 4. Flat cable
- 5. SensorTile.box
- 6. DC power USB



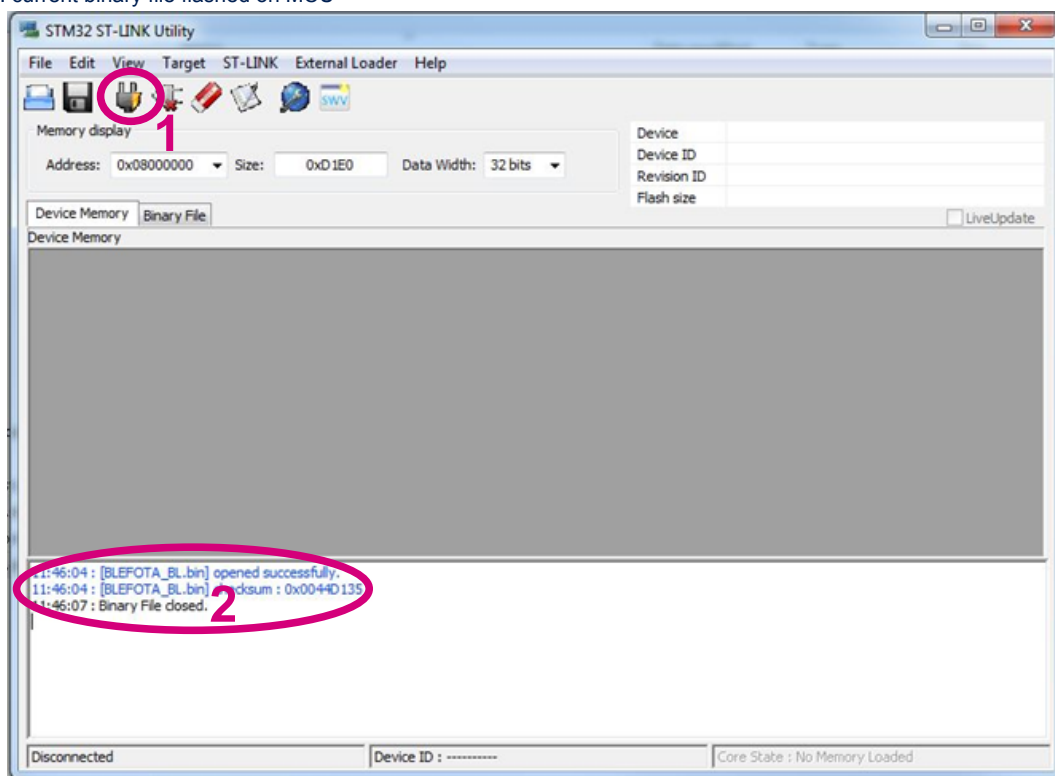
### 1.2 Run the STM32 ST-LINK Utility software

You can perform this step after the hardware components are connected and powered appropriately.

- Step 1.** Run the STM32 ST-LINK Utility software and select the **[connect to target]** icon.  
The software displays the current binary file flashed in the STM32 microcontroller of the SensorTile.box board.

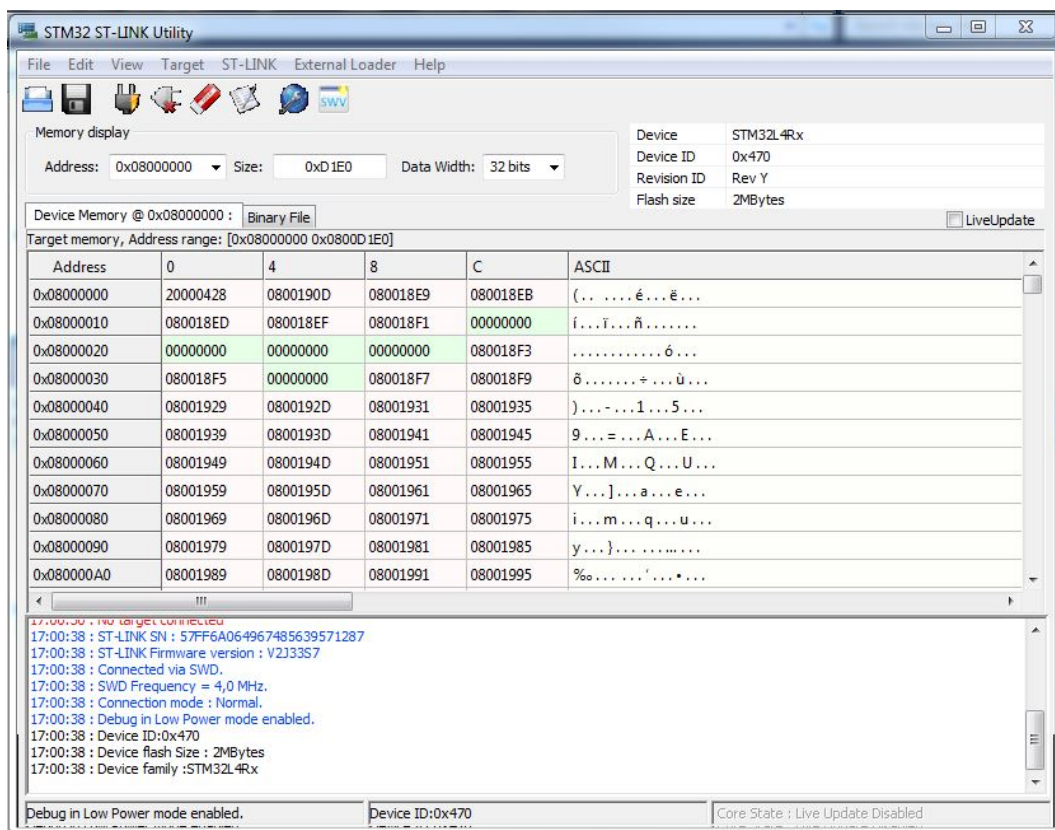
**Figure 2. STM32 ST-LINK Utility software connection with target SensorTile.box**

1. connect to target icon
2. current binary file flashed on MCU



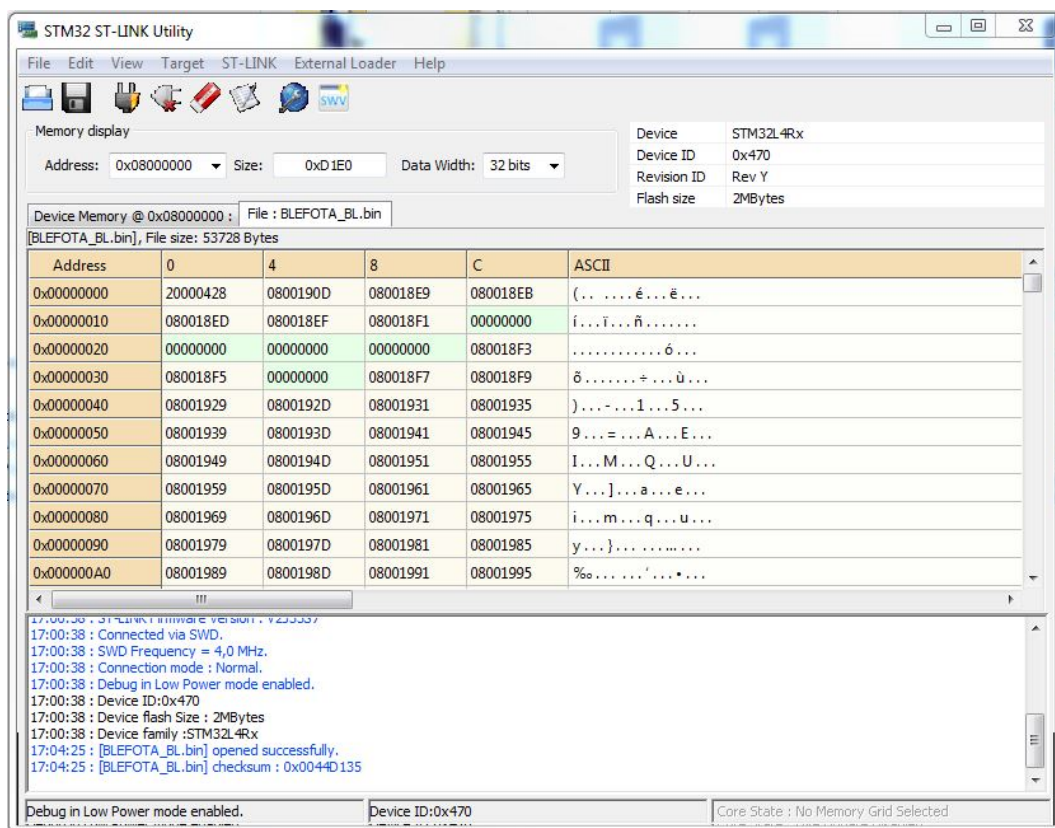
- Step 2.** Select [Target]>[Erase chip] to erase the entire STM32 flash memory.  
This step is necessary to avoid any issues when the new binary file is flashed.

**Figure 3. STM32 ST-LINK Utility software erase SensorTile.box flash**



- Step 3.** Select **[File]>[Open File]** and select the BLEFOTA\_BL.bin file on your PC.  
This bootloader file enables FOTA via Bluetooth.

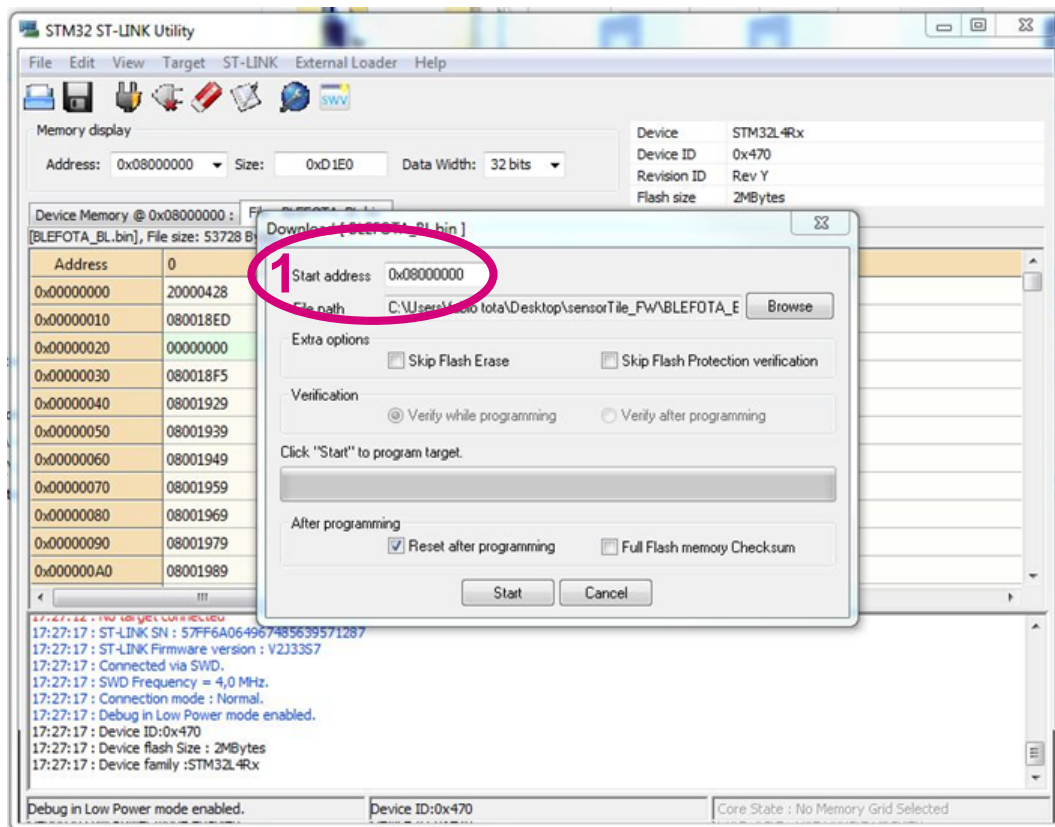
**Figure 4. STM32 ST-LINK Utility software open FOTA via BLE bootloader file**



- Step 4.** Select [Target]>[Program]  
Ensure that the start address is 0x08000000.

**Figure 5. STM32 ST-LINK Utility software load FOTA via BLE file**

1. Start address



- Step 5.** Select [Start].

Once the flashing procedure is complete, the SensorTile.box can receive the latest firmware available from ST via a Bluetooth low energy connection with a smartphone.

### 1.3 Run the ST BLE Sensor smartphone app

You can perform this step after the BLEFOTA\_BL.bin bootloader file is loaded on the SensorTile.box STM32 microcontroller.

- Step 1.** Run the **ST BLE Sensor** smartphone app and delete any old Bluetooth pairings with the SensorTile.box board.  
This helps avoid any communication issues between the smartphone application and the board.

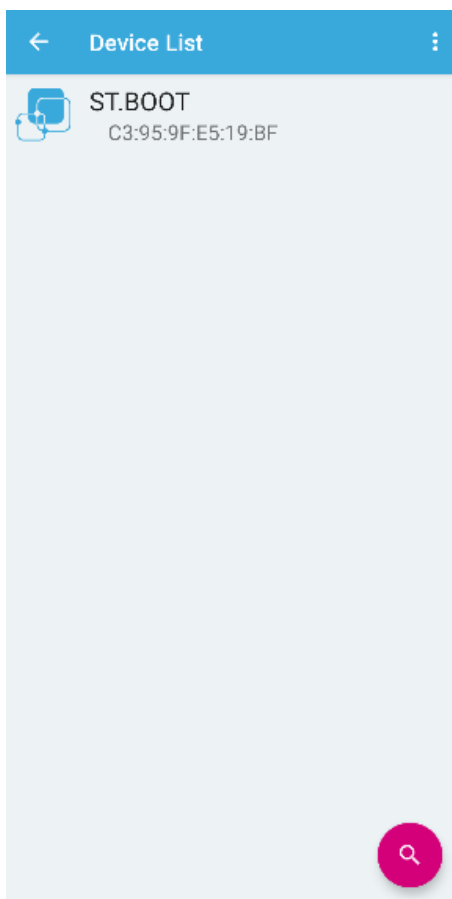
**Figure 6. ST BLE Sensor smartphone app**





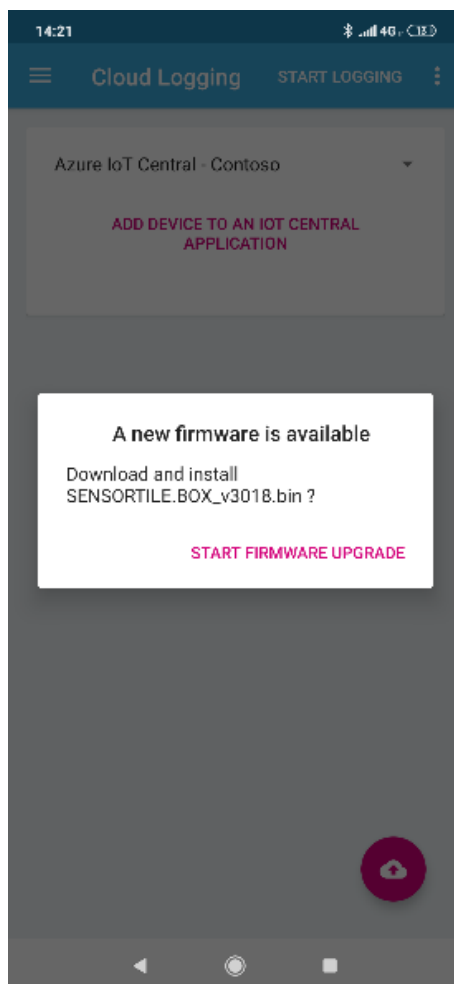
- Step 2.** Select [**CONNECT TO A DEVICE**].  
The app identifies the SensorTile.box board running BLEFOTA\_BL.bin as ST.BOOT

**Figure 7. SensorTile.box with FOTA bootloader listing in ST BLE Sensor app**



- Step 3.** Select **[ST.BOOT]** from the Device List.  
The ST BLE Sensor app retrieves the latest firmware version available for the SensorTile.box.  
If is the first time of device's phone connecting, is needed a Bluetooth connection pairing code: **123456**

**Figure 8. New firmware availability for SensorTile.box**



**Step 4.** Select **[START FIRMWARE UPGRADE]** followed by the download icon.

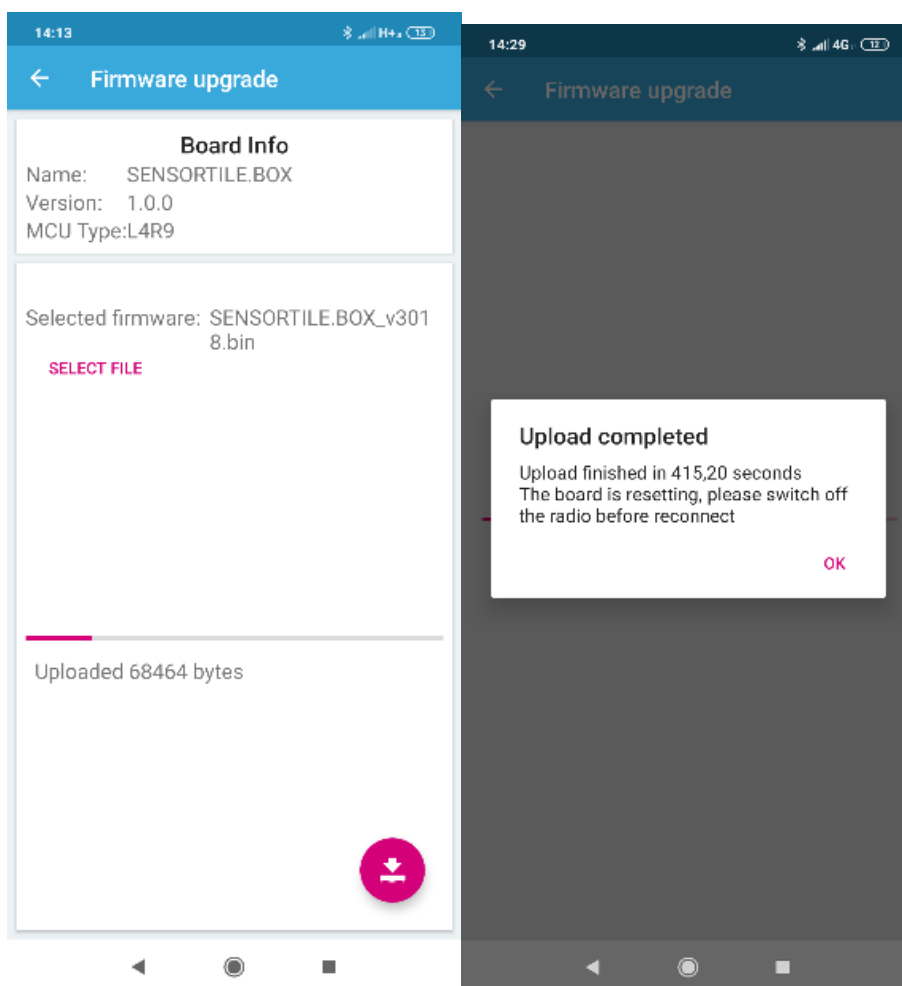
**Figure 9. Download latest SensorTile.box firmware**

1. Download icon



The app downloads the latest online version of the firmware onto the SensorTile.box STM32 MCU flash memory. The ST BLE Sensor app now identifies the board as TileBox.

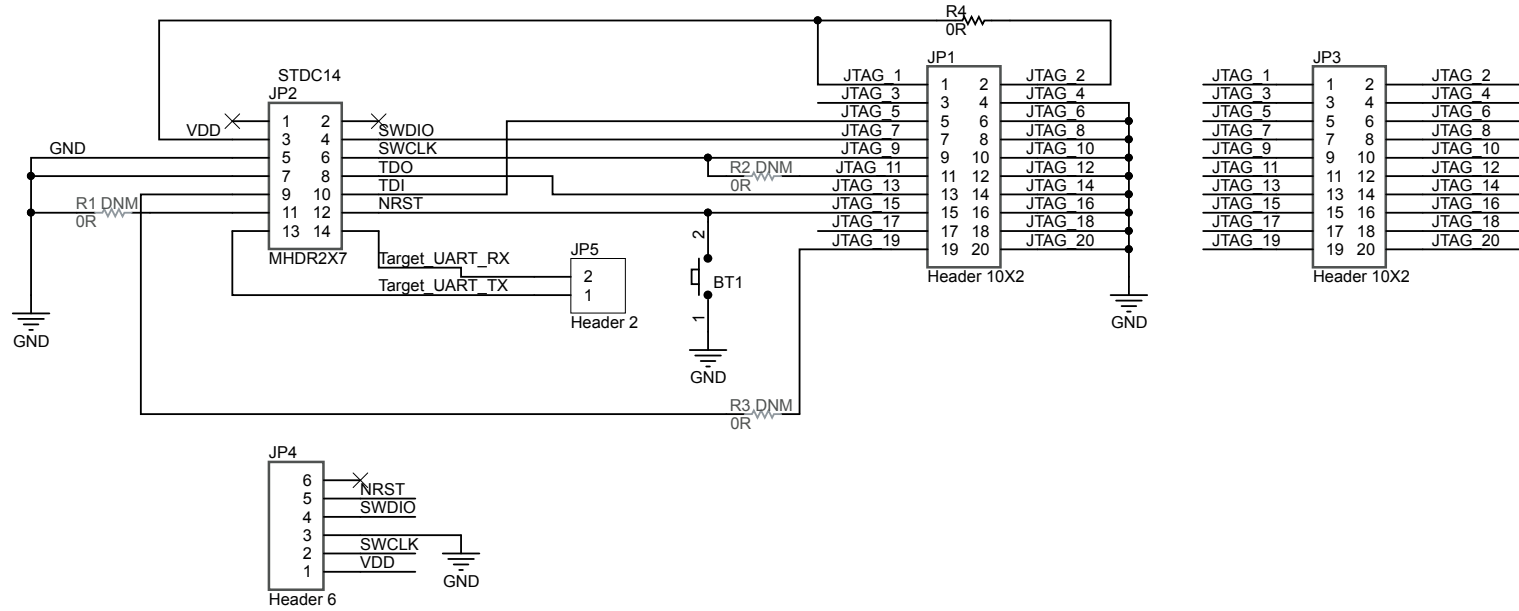
**Figure 10. STM32 ST-LINK Utility software load FOTA via BLE file**



## 2

## Schematic diagrams

Figure 11. STSW-MKSBOX1\_BL schematic diagram



## Revision history

**Table 1. Document revision history**

Date	Version	Changes
03-Sep-2019	1	Initial release.
13-Nov-2019	2	Added cover page image.
05-Dec-2019	3	Updated <a href="#">Section 1.3</a> <a href="#">Run the ST BLE Sensor smartphone app</a>

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